

Seizures and Epilepsy for the School Nurse: A Practical Guide

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Agenda

Definitions

Rescue Medications

Navigating School with Epilepsy

Epilepsy Comorbidities

What is a seizure?

Episodic event that causes temporary changes in physical movement, sensation, behavior, or consciousness that is caused by abnormal synchronous electrical activity in the brain

- Stereotyped
- Follow physiologic pattern
- Not under voluntary control
- Gold standard diagnosis : electroencephalogram (EEG)

What is epilepsy?

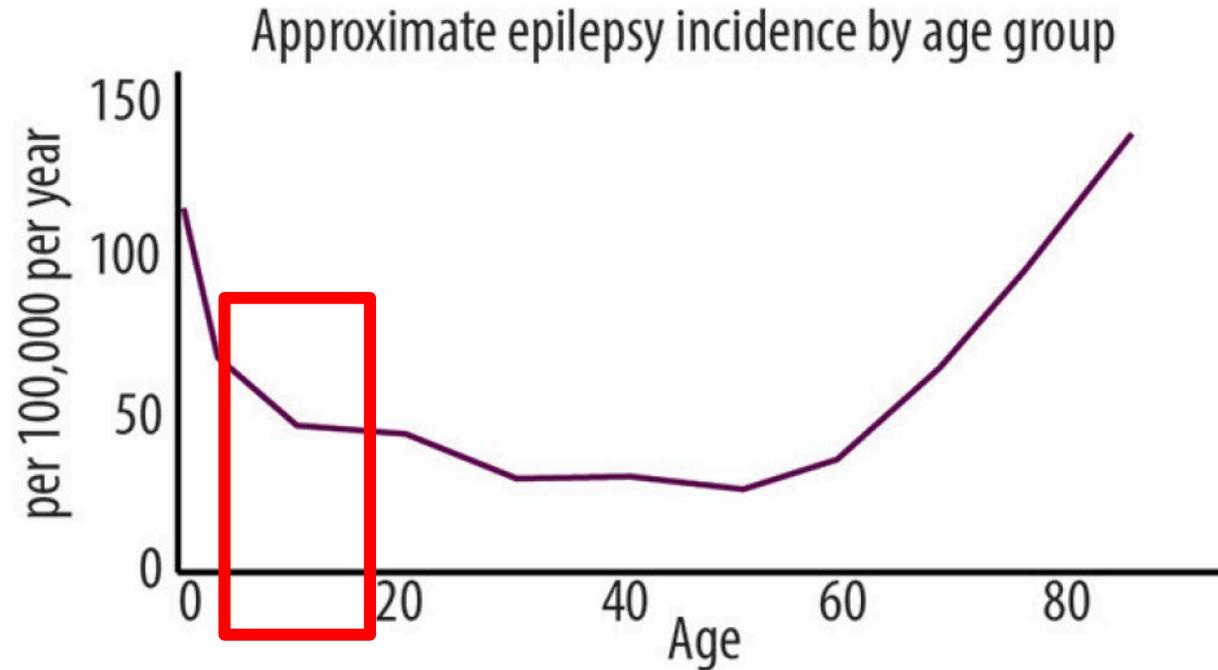
1) Two unprovoked seizures

OR

2) One unprovoked seizure + abnormal EEG indicating risk for seizures

Demographics

****1 in 65 people have epilepsy in their lifetime****



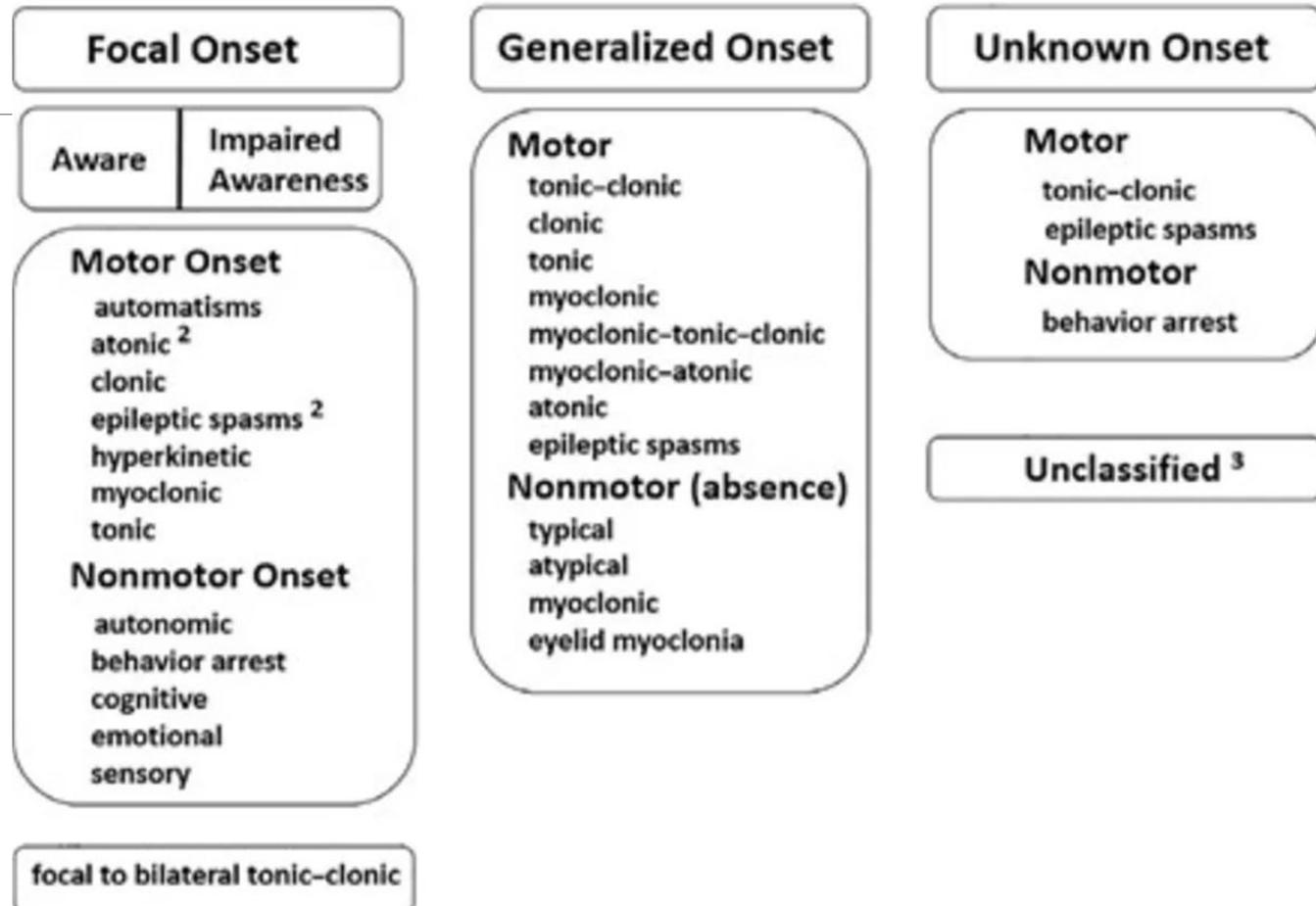
Seizure types

Focal: start in one place and spread

- Appearance depends on location in brain
- Can spread to become generalized

Generalized: involve whole brain at once

ILAE 2017 Classification of Seizure Types Expanded Version ¹



Other definitions

➤ Seizure cluster: ???

➤ Status epilepticus

- Practical: > 5 min
- Technical: > 15 min

➤ Postictal period: period of brain recovery during which person may not be functioning normally but is no longer seizing

SUDEP: Sudden Unexpected Death from Epilepsy

- 1 in 1000 people w/ epilepsy per year
- Equal risk in adults & children
- Risk factors:
 - Uncontrolled seizures
 - Off medication/noncompliant
 - Focal -> generalized tonic clonic sz
- Resources
 - Danny Did Foundation
 - EF SUDEP Institute

Management

Daily medications: “anti-seizure medications” (ASMs)

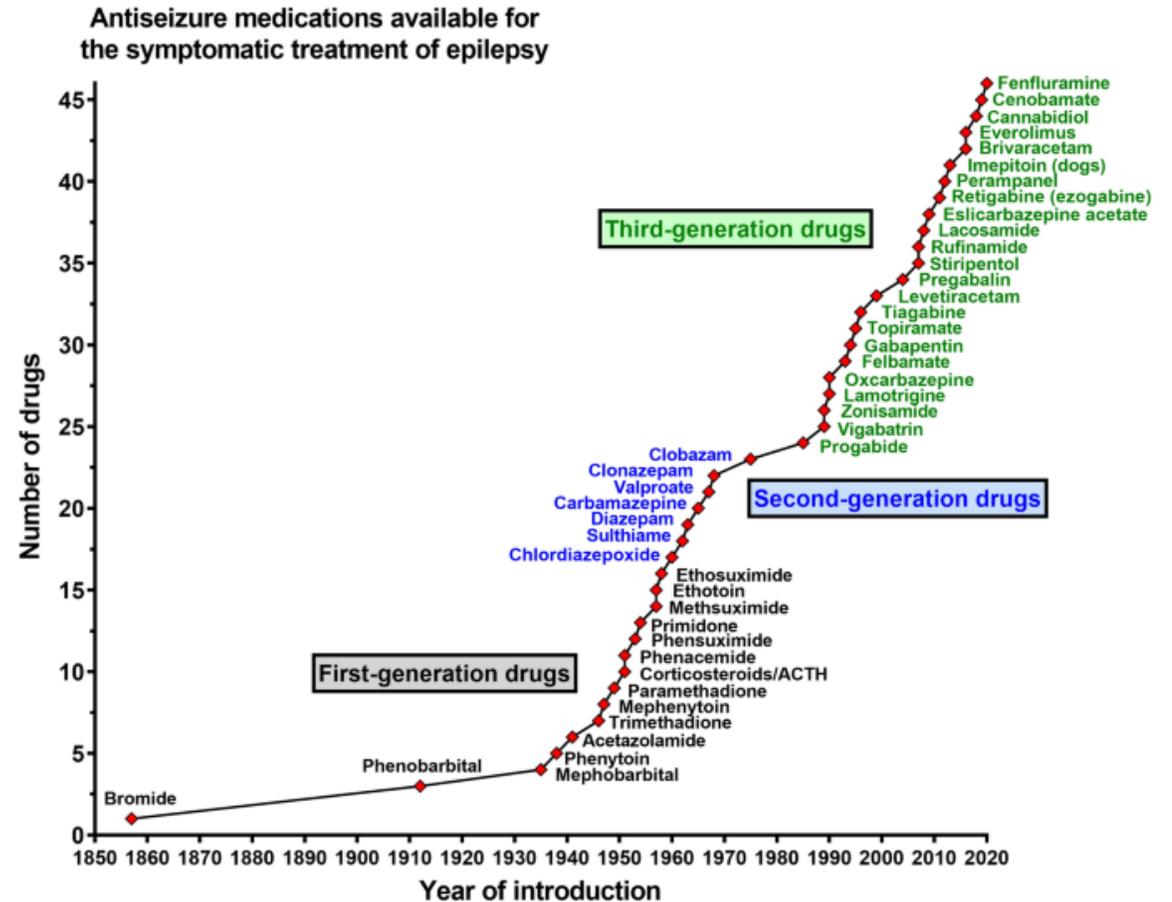
+

Rescue medications: used to stop a prolonged seizure or cluster

- *Typically* given @ 5 min
- Made so that sz can be stopped in a non healthcare setting and/or by non healthcare people

Medication Considerations

- Age
- Seizure type
- Daily vs BID vs TID
- Formulation
- Side effects



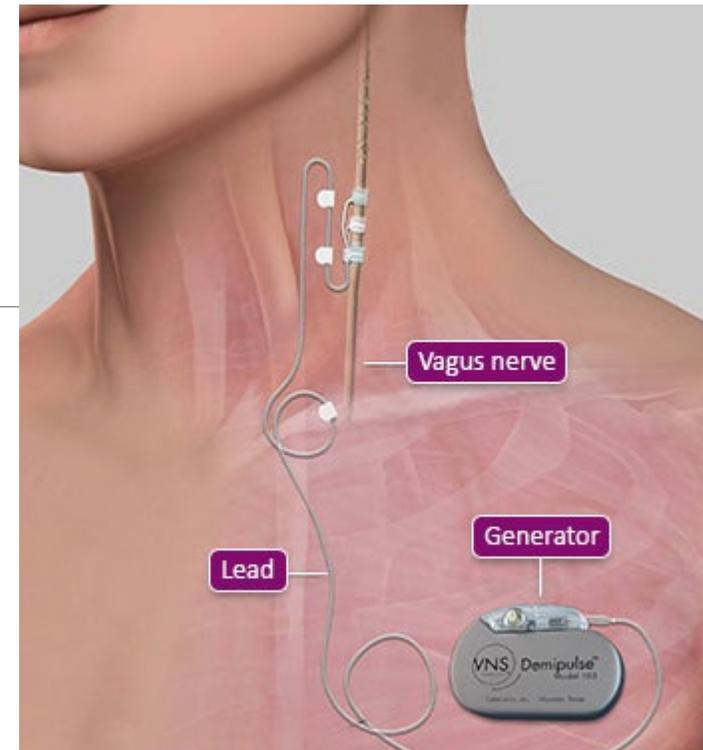
Other treatments

- ❖ Ketogenic / modified Atkins / low glycemic index diets
- ❖ Surgical resection / laser ablation
- ❖ Neuromodulation
 - Vagal Nerve Stimulator (VNS)
 - RNS/DBS

Vagal Nerve Stimulator

- 1) Stimulation throughout the day
- 2) Autostimulation (heart rate elevation)
- 3) Magnet stimulation (seizure rescue)
 - Swipe the magnet slowly across the generator
 - Can be repeated

*holding magnet over generator for > 2 sec will temporarily disable it



VNS Nursing Considerations

- PPA for VNS – best to have magnet on/near patient (backpack, wheelchair, etc.)
- Swipe at seizure onset, once again at one minute
- Common to have cough or voice change with stimulation
- Can still give rescue med at designated time(s)

Seizure rescue medications



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Diastat: rectal diazepam

First FDA approved rescue med

1 kit comes with 2 preloaded applicators + lubricant

Expiration: 4 yrs

Used mostly in babies/small children now



Diastat

Sedation side effect: 13-51%

- Very similar to post-ictal sedation
- Lower risk than prolonged seizures

Some cognitive impairment x 4 hrs

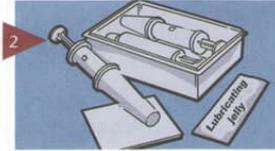
Respiratory depression risk is low: numerous studies

- (Mackereth. 2000) 50 children w/ Diastat at school
- 2 instances of respiratory difficulties:
 - Patient 1) was not given Diastat
 - Patient 2) seizure did not stop despite med admin

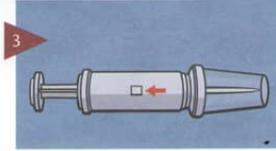
CHILD ADMINISTRATION INSTRUCTIONS



1 Put person on their side where they can't fall.



2 Get medicine.



3 Get syringe. Note: seal pin is attached to the cap.



4 Push up with thumb and pull to remove cap from syringe. **Be sure seal pin is removed with the cap.**



5 Lubricate rectal tip with lubricating jelly.



6 Turn person on side facing you.



7 Bend upper leg forward to expose rectum.



8 Separate buttocks to expose rectum.



9 Gently insert syringe tip into rectum. Note: rim should be snug against rectal opening.

SLOWLY...

COUNT OUT LOUD TO THREE...1...2...3



10 Slowly count to 3 while gently pushing plunger in until it stops.



11 Slowly count to 3 before removing syringe from rectum.



12 Slowly count to 3 while holding buttocks together to prevent leakage.



ONCE DIASTAT[®] IS GIVEN



Keep person on the side facing you, note time given, and continue to observe.

DIASTAT[®] Indication

DIASTAT[®] AcuDial[™] (diazepam rectal gel) is a gel formulation of diazepam intended for rectal administration in the management of selected, refractory patients with epilepsy, on stable regimens of AEDs, who require intermittent use of diazepam to control bouts of increased seizure activity, for patients 2 years and older.

Important Safety Information

In clinical trials with DIASTAT[®], the most frequent adverse event was somnolence (23%). Less frequent adverse events reported were dizziness, headache, pain, vasodilation, diarrhea, ataxia, euphoria, incoordination, asthma, rash, abdominal pain, nervousness, and rhinitis (1%–5%).

D955-0308

CALL FOR HELP IF ANY OF THE FOLLOWING OCCUR

• Seizure(s) continues 15 minutes after giving DIASTAT[®] or per the doctor's instructions:

- Seizure behavior is different from other episodes
- You are alarmed by the frequency or severity of the seizure(s)
- You are alarmed by the color or breathing of the person
- The person is having unusual or serious problems

Local emergency number: _____ Doctor's number: _____
(Please be sure to note if your area has 911)

Information for emergency squad: Time DIASTAT[®] given: _____ Dose: _____

Diastat
(diazepam rectal gel)

Diastat[™] AcuDial[™]
(diazepam rectal gel)

DISPOSAL INSTRUCTIONS ON REVERSE SIDE

Valtoco: Intranasal diazepam

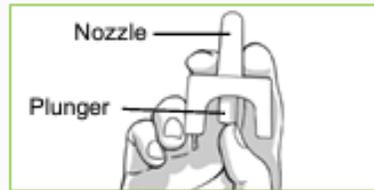
- ~ ≥ 6 yo
- 5 mg and 10 mg predosed applicators
 - 15 mg and 20 mg doses require TWO sprays
- If giving 2nd spray, use other nostril
- Passive absorption, no cooperation needed
- Similar bioavailability as Diastat
- AE: nasal discomfort, congestion, epistaxis, dysgeusia
- Expiration: 2 yrs
- *DO NOT PRIME*



To give VALTOCO nasal spray:



- Step 1:** Open the blister pack by peeling back the corner tab with the arrow.
Remove the nasal spray device from the blister pack.



- Step 2:** Hold the nasal spray device with your thumb on the bottom of the plunger and your first and middle fingers on either side of the nozzle.
Do not press the plunger yet. If you press the plunger now, you will lose the medicine.



- Step 3:** Insert the tip of the nozzle into 1 nostril until your fingers, on either side of the nozzle, are against the bottom of the nose.



- Step 4:** Press the bottom of the plunger firmly with your thumb to give VALTOCO. The person does not need to breathe deeply when VALTOCO is given.
Remove the nasal spray device from the nose after giving VALTOCO.

Nayzilam: Intranasal midazolam

- ≥ 12 yo
- 5 mg predosed applicator (*DO NOT PRIME*)
- ARTEMIS-1: randomized, double-blind
 - 53.7% w/ drug vs 34.4% placebo
 - Open label portion: w/ 2nd dose worked 80%
- If 2nd dose is given, use other nostril
- Passive absorption, no cooperation needed
- AE: nasal discomfort, throat irritation, rhinorrhea, dysgeusia, inc lacrimation
- Expiration: 2 yrs



HOLD

Hold the nasal spray device with your thumb on the plunger and your middle and index fingers on each side of the nozzle.



**DO NOT
PRESS THE
PLUNGER
YET.**

PLACE

Place the tip of the nozzle into one nostril until your fingers are against the bottom of the patient's nose.



PRESS

Press the plunger firmly.



REMEMBER TO THROW AWAY (DISPOSE OF) THE NASAL SPRAY UNIT AND BLISTER PACKAGING.

Potential Future Options



Libervant: diazepam buccal film (in comparison trials)

Staccato: inhaled (very early in trials)

*clonazepam ODT – not as fast, not as safe for GTC

How Fast Do They Begin Working?

Route of Administration	How Quick Does it Start Working
Intravenous route	30 - 60 seconds
Intranasal route	3-5, up to 10 minutes
Sublingual route	up to 15 - 30 minutes
Intramuscular route	10 - 20 minutes
Rectal route	5 - 30 minutes
Ingestion	30 - 90 minutes
VNS	Potential abortive treatment

The times stated are general estimates for rescue therapies by route of administration. Times may vary for individual products.

Maglalang PD et al. (2018) *Epilepsia*, 59(Suppl 2), 207.

Navigating School with Epilepsy



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Seizure Precautions

- Water: 1:1 supervision
 - Heights: over normal playground equipment
 - Helmet: any bike/trike/etc
 - Driving: 6 mos seizure free
-
- Patient specific considerations but generally:
 - Most sports activities are safe
 - Sensitivity to flashing lights is rare

Seizure First Aid

- ABCs
 - Stay, Safe, Side (left)
 - Nothing in the mouth
 - Time the event
 - VNS
-
- Faster sz ends = faster recovery *Time is Brain*
 - Post seizure: no special equipment needed, nursing assessment, rest
- *If child is safe, consider videoing event

Seizure First Aid

How to help someone having a seizure

1

STAY with the person until they are awake and alert after the seizure.

- ✓ Time the seizure
- ✓ Remain **calm**
- ✓ Check for **medical ID**



2

Keep the person **SAFE**.

- ✓ Move or guide away from **harm**



3

Turn the person onto their **SIDE** if they are not awake and aware.

- ✓ Keep **airway clear**
- ✓ **Loosen tight clothes** around neck
- ✓ Put **something small and soft** under the head



Call **911** if...

- ▶ Seizure lasts longer than 5 minutes
- ▶ Repeated seizures
- ▶ Person does not return to their usual state
- ▶ First time seizure
- ▶ Person is injured, pregnant, or sick
- ▶ Difficulty breathing
- ▶ Seizure occurs in water

Do **NOT**

- ✗ Do **NOT** restrain.
- ✗ Do **NOT** put any objects in their mouth.
 - ▶ **Rescue medicines can be given** if prescribed by a health care professional

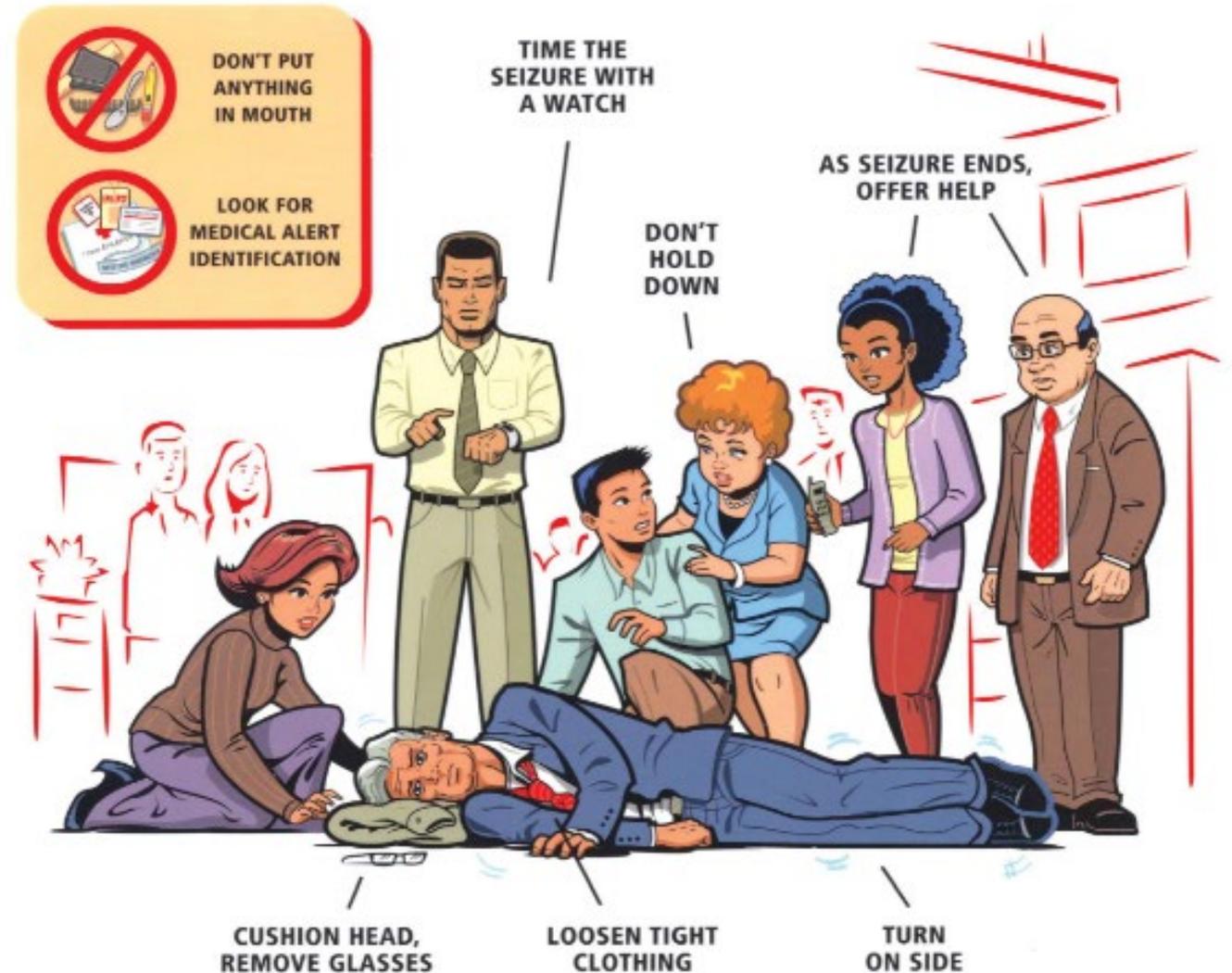
Learn more: epilepsy.com/firstaid



epilepsy.com

First Aid for Seizures

(Convulsive, generalized tonic-clonic, grand mal)



Seizure Action Plan (SAP)

All patients being treated for epilepsy

- Seizure types
- Rescue medication
 - Name, administration type, and dose
 - Timing
 - Seizure type
 - Repeat?
- Any other important info

Seizure Action Plan



Children's of Alabama UAB MEDICINE

(effective:) Medication Allergies/Intolerances: _____

This child is being treated for epilepsy. The information below is their plan to prevent and manage seizure.

Name: _____ Date of Birth: _____
 Treating Provider: _____ Phone: _____
 Emergency Contact: _____ Phone: _____

Green Zone Preventing a Seizure

Take your seizure medication the same time every day.

DAILY MEDICATION GENERIC AND BRAND NAME	Strength	AM	Afternoon	PM

Yellow Zone

Signs of a Seizure lasting 0-3 minutes

- Stiffness OR shaking of arms, legs or body
- Loss of consciousness
- Extended staring with no response to touch
- Confusion, wandering

SEIZURE FIRST AID

1. Stay calm, track time.
2. Remove from harm AND turn child to their side.
3. Protect child's head and watch breathing.
4. Do not restrain. Do not put anything in the mouth.
5. Stay with child until fully awake and notify parent or guardian.
6. If child has a Vagus Nerve Stimulator (a surgically implanted device usually over the left collarbone): Slowly swipe the magnet across the generator for 1-2 full seconds, then remove. May repeat ONE time after 60 seconds.

Red Zone

Seizures last >3-5 minutes or more

- Continue SEIZURE FIRST AID
- If child is prescribed a RESCUE MEDICATION for a seizure, FOLLOW DIRECTIONS BELOW

RESCUE MEDICATION PLAN

If this child has a history of long seizures, they may be prescribed a RESCUE medication (which can cause sleepiness).

Rescue Medication	Strength	Direction

CALL 9-1-1 IF:

- Seizure lasts > 5 minutes or DOES NOT STOP with RESCUE medication
- Child has repeat seizures without return of consciousness
- Child has signs of distress which may include breathing difficulty or face turning blue
- Child has a seizure in water or has an injury

WHEN A PARENT/GUARDIAN SHOULD CALL THE NEUROLOGY PROVIDER

- Call our office at 205-638-2551 to notify for seizure when child is safe, awake and breathing.
- You may wait until office hours unless you believe a change in seizure medication is urgent.
- If you were seen in the Emergency Department, please still call our office for an updated seizure plan.

Patient Name: _____
 DOB: _____



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Seizure Action Plan

Seizure Type(s)

- Generalized tonic-clonic Absence (staring) Tonic Atonic (drop) Myoclonic or Spasm
- Focal: _____
- Other: _____

Typical Duration: _____

How to respond when seizure occurs:

- Notify emergency contact
- Give rescue therapy according to PPA
- Other action(s): _____

When to call 911:

- Seizure > 5 minutes
- Difficulty breathing after seizure or serious injury suspected
- Seizure > _____ minutes and/or not responding to rescue therapy

Care after a seizure:

- Allow student to rest in a calm environment. Determine next steps after nurse evaluation.
- Other Instructions: _____

Typical time until able to resume normal activities: _____

After a seizure event, student should typically be able to return to class Yes No

Other activities:

- Student is not restricted with regards to sports or other school activities
- Student has the following restrictions: _____

Seizure Safe Schools Act

- Every child being treated for epilepsy should have a SAP on file
- Seizure First Aid Training
- If desired by parents, any school personnel deemed appropriate and capable by school nurse can administer seizure rescue medication (excluding rectal)

Nursing Considerations

- FREE training for staff through ALSDE
- Nasal med training kits through drug companies
- Medication storage
- Be sure to think about:
 - School bus
 - After school activities

**ALABAMA
HEALTH SERVICES
SAFE SCHOOLS
SEIZURE
CURRICULUM**



**We Teach
Alabama**

ALABAMA STATE DEPARTMENT *of* EDUCATION

**Dr. Eric G. Mackey
State Superintendent of Education
Alabama State Department of Education
Gordon Persons Building
Montgomery, Alabama 36130-2101**

January 2022

Curriculum for Designated Personnel

When to escalate care (ED)

- Seizure starts again
- Seizure doesn't stop
- Respiratory concern after seizure stops
- Specific instructions on SAP

*Not always necessary to call 911 or send student home.
Important to have a plan w/ family ahead of time

Possible seizure triggers

- Lack of sleep
- Stress
- Menstrual cycles
- Illness
- Over-stimulation
- Missed medications

Epilepsy Comorbidities

Norway registry data: 80% children have a comorbidity (vs 30% general population)

- Medical: 55%
- Neurologic: 43%
 - Cerebral palsy
 - Headaches
 - Congenital malformations
- Developmental/psych: 43%
 - Intellectual disability
 - Psych: ADHD, behavioral/emotional
 - Developmental delay

Depression/Anxiety

- Lifetime prevalence: 20-25% for each (2-3 x general population)
 - 2x as likely to have SI
 - 3x as likely to commit suicide
- Likely pathophysiologically related + meds + psychosocial factors
- Depression → dec compliance
- 70% untreated

Resources

“What to do when” : CBT at home

“The Mindful Way Through Anxiety”

“Sitting Still Like a Frog”

ALSDE Website

Suicide and Crisis Hotline: 988

COA PIRC number: [\(205\) 638-7472](tel:(205)638-7472)

Autism Spectrum Disorder (ASD)

- 20% have epilepsy
- 20% of patients with epilepsy have ASD

ADHD/Learning Disabilities

(Fastenau et al 2009): 173 children w/ epil, w/out ID, head injury, chronic physical conditions

- 48% w/ LD in at least one area

Increased risk: earlier onset, generalized convulsive sz

Other factors: Medications/medication changes, recent/frequent seizures

Next step = Neuropsych testing: school and/or clinic

Stigma

Felt stigma / insecurity / fear of embarrassment → isolation

- 40% report not wanting to tell people about their epilepsy
- 36% report feeling like they were treated differently

What they need:

- Education (of the public)
- Peer support: Epilepsy Foundation support groups
- Empowerment / Self Advocacy
- Coping strategies

Questions?

Children's of Alabama Neurology: 205-638-2551

Klalor @uabmc.edu



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